Spot Safety Project Evaluation

Project Log # 200505129

Spot Safety Project # 12-99-201

Spot Safety Project Evaluation of the Transverse Rumble Strips Installation on SR 1605–Paul Payne Store Rd at the Intersection with SR 1610–Millersville Rd in Alexander County.

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

_____ 01/31/2006
Majed Bazzari, EI Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 12-99-201 – The Intersection of SR 1610 / Millersville Rd and SR 1605 / Paul Payne Store Rd in Alexander County.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment versus comparison data has been completed to measure the effectiveness of the spot safety improvement. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of transverse rumble strips on both approaches of SR 1605 / Paul Payne Store Rd at its intersection with SR 1610 / Millersville Rd. SR 1605 / Paul Payne Store Rd is a two lane facility with dual mounted stop ahead signs and a flasher at its intersection with SR 1610 / Millersville Rd. SR 1605 has a speed limit of 55 mph. SR 1610 / Millersville Rd is also a two lane facility with a speed limit of 45 mph. The intersection is controlled by stop signs on SR 1605. The original statement of the problem was two fatal crashes have occurred at this intersection due to motorist's failure to stop at the stop sign on SR 1605.

The initial crash analysis for the intersection of SR 1605 and SR 1610 was completed from January 1, 1996 through December 31, 1998 with a total of 4 reported crashes. There were Three Angle crashes and One Left-Turn crash, which were deemed correctable by the improvement. There were two fatalities, one class A injury and three class C injuries resulting from these crashes. The final completion date for the rumble strips installation at the subject location was on November 2, 2000 with a total cost of $5,000.00.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from October 1, 2000 through December 31, 2000. The before period consisted of reported crashes from January 1, 1996 through September 30, 2000 (4 years and 9 months) and the after period consisted of reported crashes from January 1, 2001 through September 30, 2005 (4 years and 9 months). The ending date for this analysis was determined by the available crash data at the time of this analysis.

The analysis also consisted of two different sets of data, the treatment and the comparison data. The treatment data consisted of all crashes within 150 feet of the subject intersection. The comparison data consisted of all crashes within 150 feet of the intersection of SR 1605 and SR 1614 / Henry Rd. *Please see attached location map for further details.*

The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. These crash types considered are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	5	1	-80.0
Total Severity Index	34.3	1.0	-97.1
Frontal Impact Crashes	5	0	-100.0
Frontal Severity Index	34.3	0.0	-100.0
Volume	4200	4300	2.4
Comparison Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	2	1	-50.0
Total Severity Index	42.6	1.0	-97.7
Frontal Impact Crashes	1	1	0.0
Frontal Severity Index	8.4	1.0	-88.1
Volume	1250	1300	4.0
Odds Ratio: Treatment Vs Comparison			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Treatment Total Crashes	5	1	-60.0
Comparison Total Crashes	2	1	
Treatment F.I. Crashes	5	0	N/A
Comparison F.I. Crashes	1	1	

The naive before and after analysis at the treatment location resulted in an 80.0 percent decrease in Total Crashes, a 100.0 percent decrease in Frontal Impact Crashes, a 97.1 percent decrease in the Total Severity Index, a 100.0 percent decrease in the Frontal Severity Index, and a 2.4 percent increase in Average Daily Traffic (ADT). The comparison locations resulted in a 50.0 percent decrease in Total Crashes, a 0.0 percent change in Frontal Impact Crashes, a 97.7 percent decrease in the Total Severity Index, an 88.1 percent decrease in the Frontal Severity Index, and a 4.0 percent increase in ADT. The before period ADT year was 1998 and the after period ADT year was 2003.

The Odds Ratio is used as another means of calculating the treatment effect. The total crashes in the before and after period from the Comparison intersections are used to calculate the percent reduction in total crashes for the Treatment Intersection. As shown in the table above, using the Odds Ratio calculation, there is a 60.0 percent decrease in Total Crashes at the treatment intersection.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in an 80.0 percent decrease in Total Crashes and a 100.0 percent decrease in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in the number and severity of both Total and Target crashes from the before to the after period.

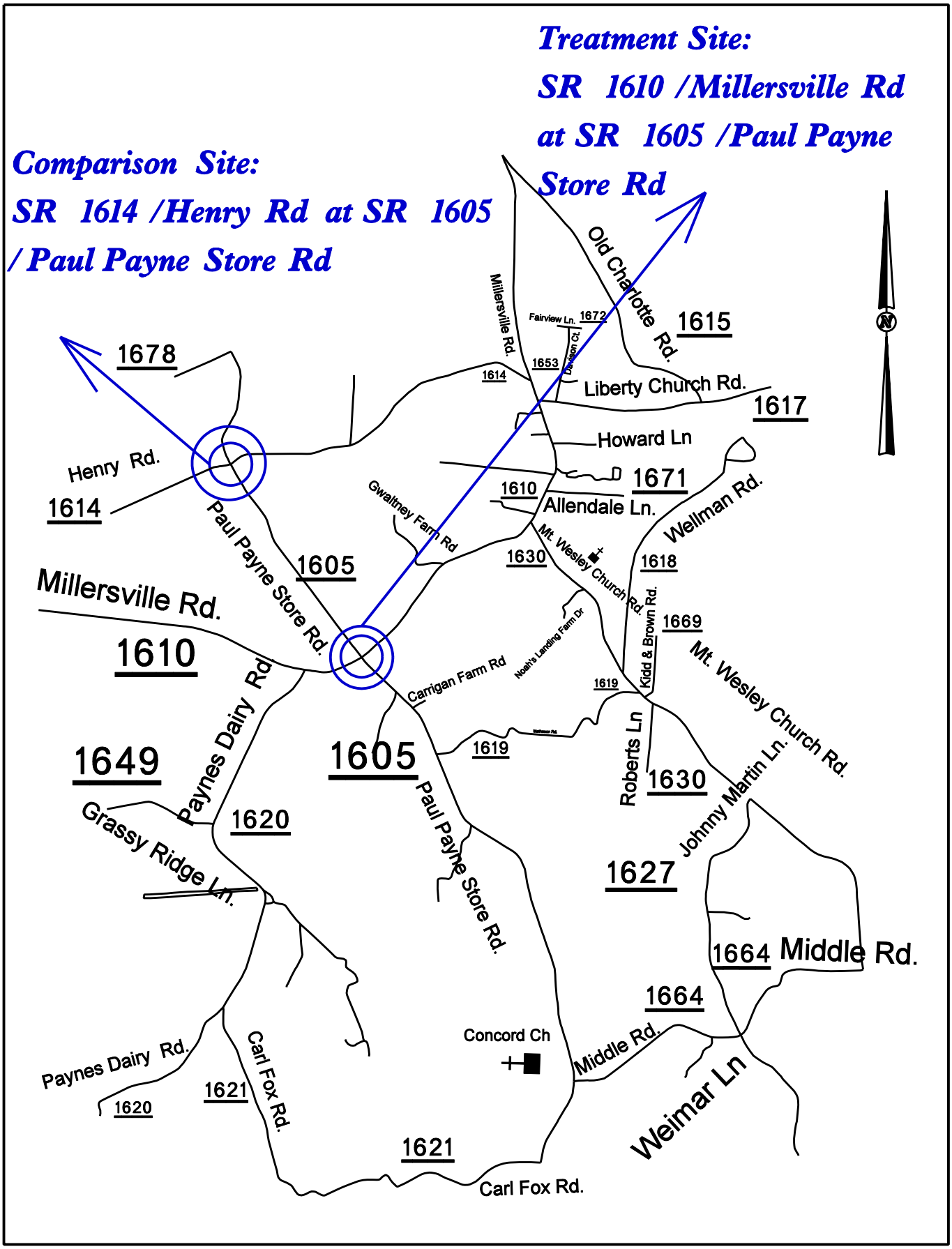
As previously mentioned the transverse rumble strips installation was justified by two fatal crashes occurring at this intersection due to motorists running through the stop signs. The severity index was decreased significantly which may be due to two fatal crashes causing a very high severity index in the before period. The treatment sight had stop signs, stop ahead signs and an overhead flasher prior to the installation of the transverse rumble strips. All countermeasures likely contributed to the increasing safety of this intersection.

The transverse rumble strips were installed in the year 2000. From the field investigation it was noticed that the rumble strips had a minimal vibrating effect. This may be due to the life expectancy of the rumble strips. The average life of thermoplastic rumble strips is 3 – 5 years, therefore maintenance improvements may be needed at this location. *Please see attached photos.*

The countermeasure crash reduction for Total Crashes at the subject intersection can be in the range of a 60.0 percent decrease to an 80.0 percent decrease in crashes. The countermeasure crash reduction for Frontal Impact Crashes at the subject intersection is 100.0 percent decrease in crashes. As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

Evaluation of Spot Safety Project Number 12–99–201

Location Map, Alexander County



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Treatment Site Photos Taken on January 12, 2006

Travelling south on SR 1605 – Paul Payne Store Rd

Travelling south on SR 1605 – Paul Payne Store Rd

Travelling south on SR 1605 – Paul Payne Store Rd

Travelling south on SR 1605 – Paul Payne Store Rd

Sight Distance at the intersection looking east on SR 1610 – Millersville Rd

Travelling north on SR 1605 – Paul Payne Store Rd

Travelling north on SR 1605 – Paul Payne Store Rd

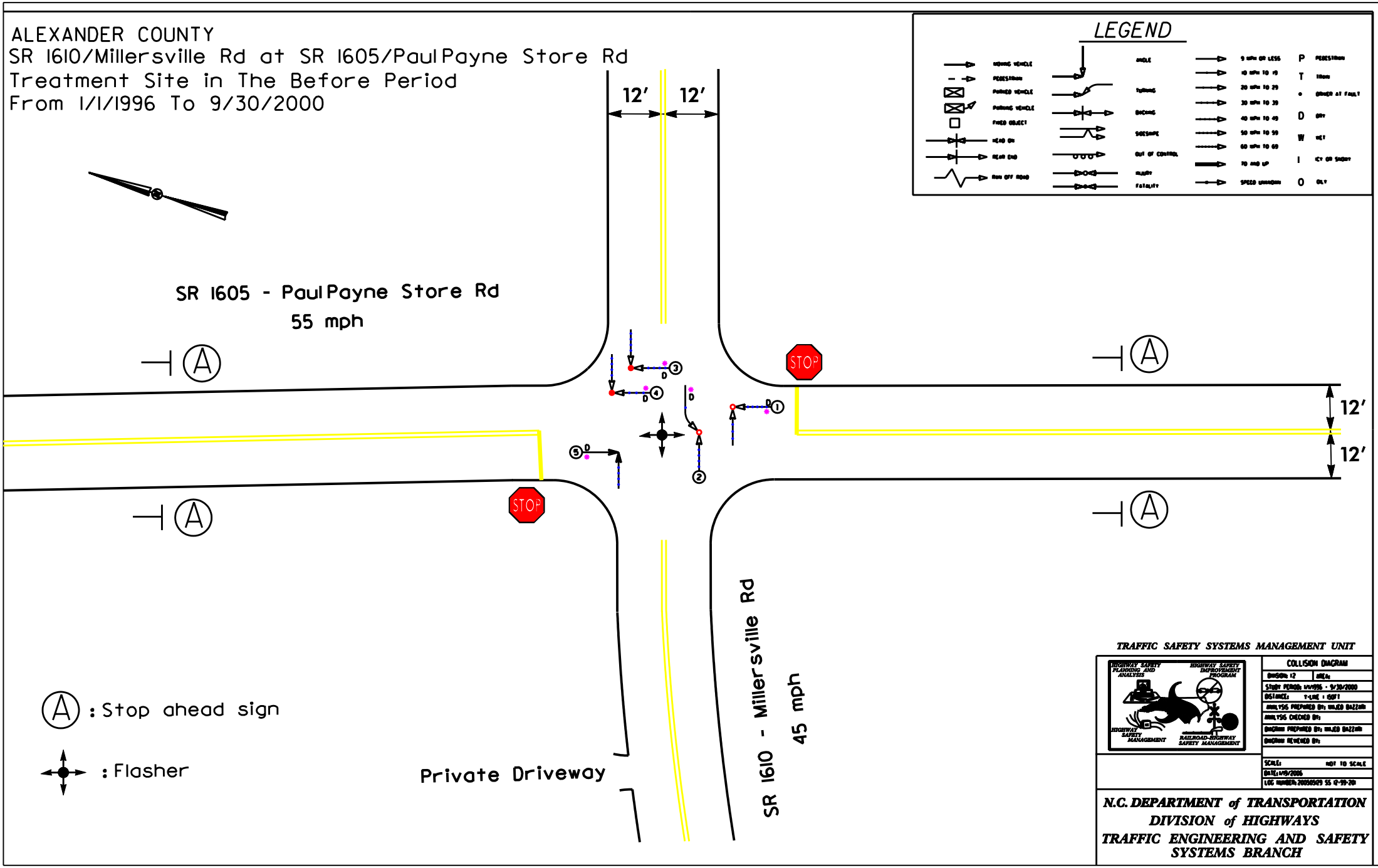
Travelling north on SR 1605 – Paul Payne Store Rd

Sight Distance at the intersection looking west on SR 1610 – Millersville Rd

Travelling east on SR 1610 – Millersville Rd

Travelling west on SR 1610 – Millersville Rd

ALEXANDER COUNTY
SR 1610/Millersville Rd at SR 1605/Paul Payne Store Rd
Treatment Site in The Before Period
From 1/1/1996 To 9/30/2000



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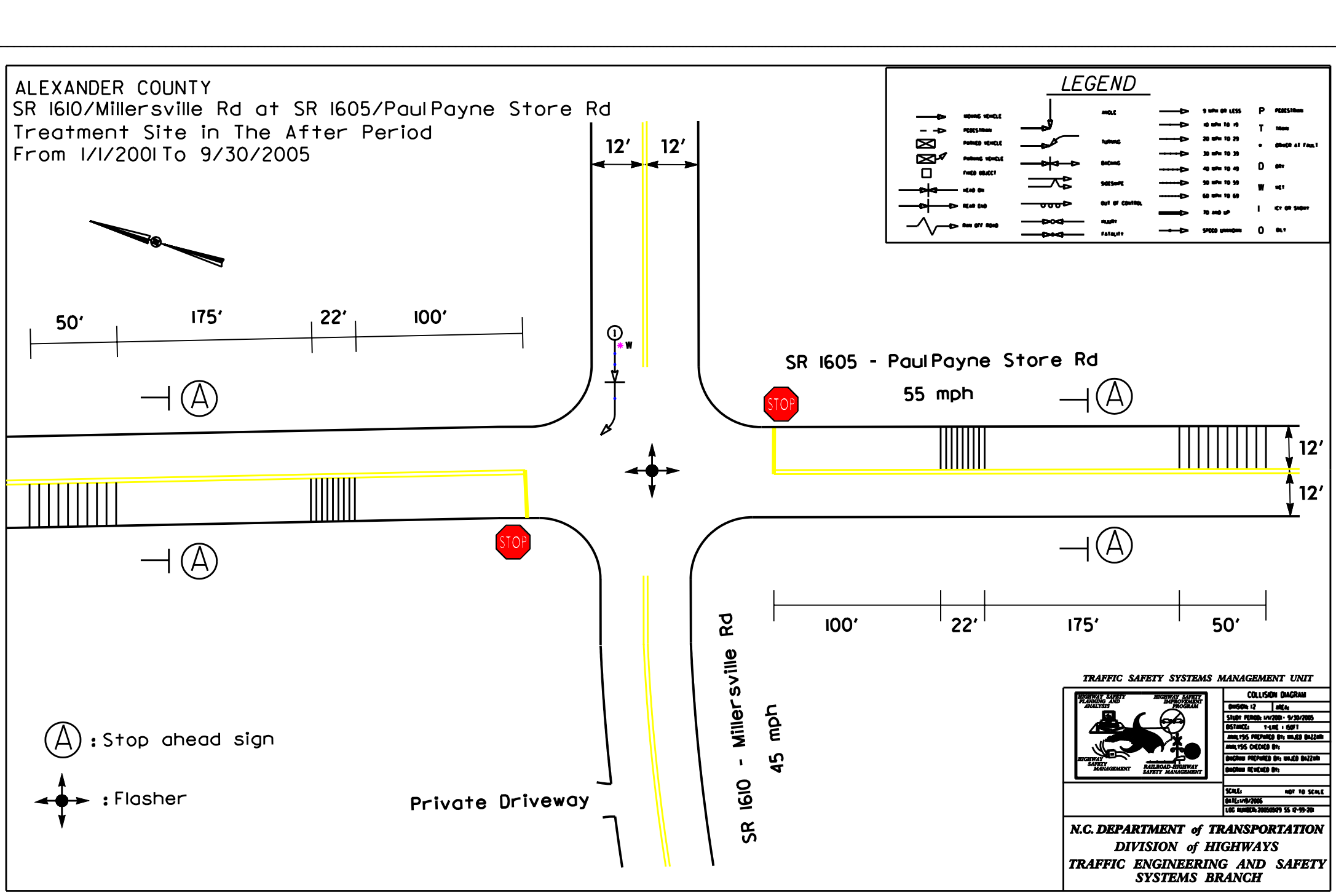
ALEXANDER COUNTY
SR 1610/Millersville Rd at SR 1605/Paul Payne Store Rd
Treatment Site in The After Period
From 1/1/2001 To 9/30/2005



after.dgn 05/04/2006 02:03:50 PM